

An Examination of FIN 48 Disclosures: Evidence from Korean Companies*

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Financial Accounting Standards Board (FASB) Interpretation No. 48 (FIN 48), Accounting for Uncertainty in Income Taxes: An interpretation of FASB Statement No. 109, requires firms to evaluate uncertain tax positions and disclose information on their liabilities for these positions, unrecognized tax benefits (UTBs). We analyze the FIN 48 disclosures for calendar-year-end Korean companies listed on NYSE and NASDAQ and examine the Korean firms' tax aggressiveness utilizing the UTBs. The results suggest that stock exchange and firm size do not play a role in the Korean firms' tax aggressiveness, contrary to the matched U.S. firms and that the Korean firm in the miscellaneous retail industry is more tax aggressive than the firms in the communications, depository institutions and business services. In addition, we find evidence that the Korean firms are less tax aggressive than the matched U.S. firms. We also examine the Korean firms' tax avoidance tendencies using other measures of avoidance, leading to mixed results. Finally, we examine the association between the UTBs and other measures of tax avoidance and find a significant and negative association between the UTBs and the long-run cash effective tax rate.

Keywords : *FIN 48, ASC 740-10, Unrecognized Tax Benefits, Tax Avoidance, Tax Aggressiveness*

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I. Introduction

Prior to Financial Accounting Standards Board (FASB) Interpretation No.48 (FIN 48), *Accounting for Uncertainty in Income Taxes: An interpretation of FASB Statement No. 109*, there was no specific guidance on how to address accounting for the uncertainty in income taxes.^{1) 2)} Accordingly, on July 13, 2006, the FASB issued FIN 48, the most significant change in accounting for income taxes over the past decade, to increase comparability of reporting for income tax assets and liabilities and provide more information on income tax uncertainty.³⁾ This enables financial statement users including tax authorities and researchers to have more information on the firm's uncertainty in income taxes. In particular, FIN 48 implementation enables the financial statement users to use new measures of tax avoidance. In fact, prior studies suggest that even though still being subject to earnings management, the unrecognized tax benefits (UTBs), the firm's liabilities for uncertain tax positions, overcome many of shortcomings of existing financial statement-based measures of corporate tax avoidance and provide a promising measure of tax aggressiveness (e.g., Frischmann, Shevlin, and Wilson, 2008; Watson, 2011).⁴⁾

1) Now FIN 48 is coded as Accounting Standards Codification (ASC) Subtopic 740-10.

2) As a result, divergent accounting practices developed resulting in noncomparability in financial reporting of income taxes and financial statement users had limited information on the impact of the uncertainty in income taxes on financial statements. Moreover, this lack of comparability provided firms the ability to use contingent tax liabilities for earnings management.

3) FIN 48 implemented a two-step approach regarding the recognition and measurement of uncertain tax benefits and created new disclosures.

4) As taxes put a significant cost burden on firms, firms generally participate in tax planning and investors are concerned about these activities. However, most investors do not have access to firms' tax return information and thus utilize financial statements to evaluate firms' tax avoid-

Under the circumstances, we extend the literature on corporate tax avoidance by using FIN 48 disclosures for calendar-year-end Korean companies listed on New York Stock Exchange (NYSE) and National Association of Securities Dealers Automated Quotation (NASDAQ). First, consistent with the findings of prior research, the analysis reveals that FIN 48 improves consistency of disclosure and provides more information on the firm's income tax uncertainty. Specifically, the analysis shows that scaled ending UTBs increased after the adoption and were mainly accounted for by the uncertain tax positions leading to permanent book-tax differences. Moreover, we document that it is unlikely that the NTS less frequently audit firms with strong facts. However, we also find that there is still inconsistency in the FIN 48 disclosures and that the explanations provided lack details such that the FIN 48 disclosures do not provide information on the nature of the income tax uncertainty. Accordingly, we additionally analyze the uncertain tax positions for a certain Korean firm using confidential data. This analysis reveals that one of the firm's uncertain tax positions is associated with tax exemption on small or medium venture start-up enterprises.

Furthermore, we analyze the results of tax audits for the Korean firms utilizing the FIN 48 disclosures. Half of the firms examined by the NTS disclose the results and most of them indicate that there were no significant adjustments to the tax returns of prior years or that they filed an appeal with respect to the NTS's tax assessments. We also find that the larger firms released more tax reserves at the adoption of FIN 48, indicating that FIN 48 reduces, to some degree, earnings management via tax reserves, consistent with the findings of prior literature.

Finally, we examine the Korean firms' tax avoidance tendencies using measures of

ance activities, leading to various financial statement-based measures of tax avoidance which have some shortcomings.

avoidance including UTBs. We first analyze the Korean firms' tax aggressiveness utilizing scaled ending balance of UTBs. The results indicate that stock exchange and firm size do not play a role in the Korean firms' tax aggressiveness, contrary to the matched U.S. firms and that the Korean firm in the miscellaneous retail industry is more tax aggressive than the firms in the communications, depository institutions and business services. In addition, we find that the Korean firms are less tax aggressive than the matched U.S. firms and that the Korean firms listed on NYSE and NASDAQ, the Korean firms in the primary metal industries, communications and business services industry, and the Korean firms in any Asset Quintile except for Asset Quintile 4 are less tax aggressive than the matched U.S. firms. However, given that income tax uncertainty arises from the complexity of the application of income tax laws and regulations and the ambiguity of these laws and regulations, the difference of tax regime including income tax laws and regulations and their application may lead to the results. Moreover, given that UTBs are still subject to managerial incentives to manage earnings (e.g., De Simone, Robinson, and Stomberg, 2011). Therefore, the results must be interpreted with care. Second, we analyze the Korean firms' tendencies of tax avoidance using other measures of avoidance, leading to mixed results. These may arise from the tax avoidance measures which reflect the different elements of avoidance. Finally, we examine the association between the UTBs and other measures of tax avoidance and find a significant and negative association between the UTBs and the long-run cash effective tax rate.

Our study contributes to the literature on corporate income tax by analyzing both the FIN 48 disclosure, which is the only publicly available information on income tax uncertainty, and several uncertain tax positions of the Korean firms listed on NYSE and NASDAQ. In addition, this study adds to the literature on corporate tax avoidance by examining the Korean firms' tax aggressive-

ness using UTBs, a direct measure of uncertain tax positions that would be challenged upon examination.

The remainder of the paper proceeds as follows. The next section explains how FIN 48 is designed to account for tax uncertainty and could reveal information on corporate tax avoidance, and reviews the related literature. In Section III, we describe the data and sample characteristics, and discuss our results. Finally, Section IV concludes.

II. Background and Literature Review

2.1 Accounting for Uncertainty in Income Taxes

Uncertainty about the sustainability of income tax positions arises because the application of income tax laws and regulations is inherently complex and these laws and regulations are often ambiguous, and firms are needed to account for these uncertain tax positions. Prior to FIN 48, however, there was no specific guidance on how to address accounting for tax uncertainty.⁵⁾ Accordingly, most firms instead followed the loss-contingency approach of SFAS No. 5, *Accounting for Contingencies*, and accrued contingent liabilities for uncertain tax positions when losses were probable and the amounts were reasonably estimable.

However, this SFAS No. 5's guidance regarding the recognition and measurement of income tax positions was vague and many firms considered audit probability when determining the probability and amount of losses (Blouin, Gleason, Mills, and Sikes, 2007) even though SFAS No. 5 did not permit firms to consider audit probability when assessing the likelihood of potential losses. Moreover, few firms disclosed any information on tax

5) Statement of Financial Accounting Standards (SFAS) No. 109, *Accounting for Income Taxes*, did not indicate how firms should address uncertainty in accounting for income taxes (FIN 48, Summary).

contingencies and most that did provided only limited information, such as a boilerplate statement that contingent tax liabilities were aggregated with contingencies (Gleason and Mills, 2002). Under this reporting regime, divergent accounting practices developed resulting in noncomparability in financial reporting of income tax assets and liabilities. In addition, this lack of comparability worsened the information asymmetry and provided firms the ability to use contingent tax liabilities for earnings management.⁶⁾ Indeed, prior literature finds that firms use income tax reserves to manage earnings (Dhaliwal, Gleason, and Mills, 2004; Blouin and Tuna, 2007; Gupta, Laux, and Lynch, 2011).

The FASB concerned these diverse accounting practices and issued FIN 48, which became effective for fiscal years beginning after December 15, 2006, on July 13, 2006 to increase comparability of reporting for income tax assets and liabilities and provide more information on the uncertainty in income taxes.⁷⁾ Specifically, FIN 48 implemented a two-step approach to account for uncertain tax positions and created new disclosures. For the first step, recognition, a firm must identify an uncertain tax position and consider whether it is more likely than not (greater than 50 percent) that the uncertain tax position will be upheld on examination, based solely on its technical merits. When making this determination, the firm must assume that the relevant tax authority will audit the tax position and will have full knowledge of all relevant facts.

6) Managers can smooth earnings to consistently meet analysts' forecasts, thereby creating cookie jar reserves (Levitt, 1998; Badertscher, Phillips, Pincus, and Rego, 2009). Tax reserves are one example of the cookie jar reserves (Cazier, Rego, Tian, and Wilson, 2011).

7) FIN 48 became effective for certain nonpublic enterprises, including nonpublic not-for-profit organizations, for fiscal years beginning after December 15, 2008 (see FASB Staff Position (FSP) No. FIN 48-3, *Effective Date of FASB Interpretation No. 48 for Certain Nonpublic Enterprises*).

Accordingly, the firm cannot incorporate the probability of audit in step one. If the tax position does not meet the more-likely-than-not test, the firm cannot recognize any tax benefit. For the second step, measurement, the firm must measure the tax benefit that can be recognized in its financial statements as the largest amount of benefit that is more likely than not likely to be realized upon settlement. The amount that fails to meet the more-likely-than-not threshold is the unrecognized tax benefit (UTB), reported as a liability.

The firm must also provide specific financial statement disclosures under FIN 48. Specifically, paragraph 21 of FIN 48 (currently coded as ASC 740-10-50-15) requires disclosure of five items annually. First, the firm must disclose a tabular reconciliation of the gross amounts of beginning and ending UTBs. It must include at least the change in UTBs as a result of prior tax positions, the change in UTBs as a result of current tax positions, reductions to UTBs due to settlements with relevant taxing authorities, and reductions to UTBs due to lapsing of applicable statute of limitations. Second, the firm must separately disclose the total amount of UTBs which would, if recognized, affect the effective tax rate. Third, the disclosure should include the amounts of interest and penalties recorded in the statement of operations and the amounts of accrued interest and penalties recorded in the statement of financial position. Fourth, the disclosure should contain any possible significant changes in UTBs during the next 12 months. Specifically, the forward-looking disclosure should include the nature of both the uncertainty and the event, and either an expected range of the possible changes or a statement that the range cannot be made. Finally, the firm should describe the years that remain open to examination by major jurisdictions. Moreover, paragraph 20 of FIN 48 (currently coded as ASC 740-10-50-19) requires the firm to stipulate its policy on income statement classi-

fication of interest and penalties.⁸⁾ In addition to the preceding requirements, in the year of FIN 48 adoption, the firm must also disclose a cumulative-effect adjustment to the beginning balance of retained earnings in accordance with paragraph 24 of FIN 48.

As standardizing accounting for income tax uncertainty and requiring detailed disclosure of UTBs, FIN 48 reduces the diversity in accounting practice, resulting in significant changes in the measurement process of UTBs for many firms, improves consistency of disclosure and provides investors with more information on the impact of the uncertainty in income taxes on financial statements (e.g., Dunbar, Kolbasovsky, and Phillips, 2007; Nichols, Baril, and Briggs, 2007). That said, there is still inconsistency in the disclosures and more guidelines for disclosing the UTBs are needed, in particular regarding interest and penalties (e.g., whether the gross amounts of UTBs include or exclude accrued interest and penalties) and the impact of changes in UTBs on balance sheet accounts except retained earnings such as deferred tax assets and liabilities, goodwill, and accumulated other comprehensive income (Blouin et al., 2007; Dunbar et al., 2007).⁹⁾ In addition, the disclosures provide ambiguous explanations (Nichols, 2008) and an expected range of the possible changes within the next 12 months is subject to significant forecast errors due to task difficulty (Dunbar, Omer, and Schultz, 2010).

Even though FIN 48 is implemented to

provide information on income tax uncertainty for financial statement users, tax authorities also observe the new disclosures. Accordingly, critics expressed concerns the FIN 48 disclosures would involve proprietary costs in that it would provide tax authorities with a roadmap in future tax audits and increase tax payments. Indeed, prior literature suggests that FIN 48 makes tax authorities better off (Mills, Robinson, and Sansing, 2010) even though they are unlikely to obtain much useful information from the disclosures which do not provide a disaggregation by jurisdiction (Nichols, 2008) and deters firms from participating in uncertain income tax avoidance (Mills et al., 2010; Gupta, Mills, and Towery, 2012). In addition, Blouin, Gleason, Mills, and Sikes (2010) document that FIN 48 led to an increase in settlements and a decrease in tax reserves between FIN 48 enactment and adoption. However, FIN 48 does not necessarily make all firms worse off. In fact, firms with strong facts benefit from the disclosure requirements because tax authorities less frequently audit them (Mills et al., 2010).

2.2 UTBs as a Tax Avoidance Measure

Most stakeholders including investors and researchers utilize financial statements to evaluate firms' tax planning activities because tax returns are private. Accordingly, various financial statement-based measures of income tax avoidance have been developed. In particular, prior to FIN 48 adoption, the GAAP effective tax rate, the cash effective tax rate, the long-run cash effective tax rate, total book-tax differences, permanent book-tax differences, and residual book-tax differences developed by Desai and Dharmapala (2006) are commonly used to examine corporate tax avoidance.¹⁰⁾ However,

8) The firm can recognize the interest and penalties as either expenses or income taxes according to paragraph 19 of FIN 48 (currently coded as ASC 740-10-45-25), which requires its classification choice to be consistently applied.

9) Firms which engage in a higher level of corporate tax avoidance comply less with the FIN 48 disclosure requirements and disclose less specific information (Robinson and Schmidt, 2012), inconsistent with the finding that firms engaging in aggressive tax planning increase disclosure volume to mitigate the financial transparency problems associated with tax aggressiveness (Balakrishnan, Blouin, and Guay, 2011).

10) We define tax avoidance as any activity that results in increasing after-tax income. Accordingly, it contains certain tax positions, perfectly legitimate, such as municipal bond investments as well as uncertain tax positions that might be challenged by relevant tax authorities and determined illegal (e.g., Hanlon and Heitzman, 2010; Lisowsky et al., 2012).

each measure has limitations as well as strengths.

First, the GAAP effective tax rate (*ETR*), calculated as the ratio of total tax expense to pretax income, is not affected by tax deferral strategies and does not reflect conforming tax avoidance such as tax deductibility of interest expense whose effect on financial and taxable income conform (Hanlon and Heitzman, 2010; Lisowsky, Robinson, and Schmidt, 2012). Moreover, it captures tax accounting accruals, which are not tax strategies, such as valuation allowances and tax reserves (Dyreg, Hanlon, and Maydew, 2008; Hanlon and Heitzman, 2010) and is confounded by accounting earnings management (Hanlon and Heitzman 2010; De Simone et al., 2011).

Second, the cash effective tax rate (*CETR*), calculated using cash taxes in the numerator, can only reflect non-conforming tax avoidance and mismatch the cash taxes paid and earnings if cash taxes include estimated tax payments, settlements with relevant tax authorities, and refunds over previous year tax returns (Cazier, Rego, Tian, and Wilson, 2009; Hanlon and Heitzman, 2010). In addition, it is still confounded by accounting earnings management (Hanlon and Heitzman 2010; Watson, 2011) and does not control for permanent and/or temporary nondiscretionary items such as intangible assets and property, plant, and equipment (Frank, Lynch, and Rego, 2009).

Third, the long-run cash effective tax rate (*LR_CETR*) still does not control for permanent and/or temporary nondiscretionary items (Frank et al., 2009) and reflect conforming tax avoidance (Hanlon and Heitzman, 2010). It is also not available to new companies. Moreover, prior literature documents that it is not significantly associated with tax shelter usage (Lisowsky, 2010).

Fourth, total book-tax differences (*BTD*), calculated as the difference between book and (estimated) taxable income, by definition only reflect non-conforming tax avoidance (Hanlon and Heitzman, 2010). In addition, this measure is not necessarily reflec-

tive of corporate tax avoidance (Manzon and Plesko, 2002; Hanlon, 2003).¹¹⁾ The *BTD* measure does not control for permanent and/or temporary nondiscretionary items (Frank et al., 2009) and reflects earnings management activities to the extent that temporary book-tax differences are reflective of accounting earnings management (e.g., Phillips, Pincus, and Rego, 2003; Frischmann et al., 2008).

Fifth, permanent book-tax differences (*PBTD*) exclude tax avoidance activities leading to temporary differences (Cazier et al., 2009; Frank et al., 2009) and capture tax shelters poorly or not at all (Wilson, 2009; Lisowsky et al., 2012). Moreover, this measure still does not reflect conforming tax avoidance (Lisowsky et al., 2012) and control for permanent nondiscretionary items such as goodwill and state taxes (Frank et al., 2009).

Finally, residual book-tax differences (*DD*), the residual from the regression of total book-tax differences on total accruals, exclude, at least partially, book-tax differences caused by accounting earnings management (Desai and Dharmapala, 2006; Chen, Chen, Cheng, and Shevlin, 2010). However, this measure does not necessarily reflect tax avoidance activities due to not controlling for nondiscretionary items leading to permanent and/or temporary differences (Frank et al., 2009).^{12),13)}

Taken together, these measures of tax avoidance are subject to measurement error and reflect different aspects of corporate tax avoidance (e.g., Cazier et al., 2009; Lisowsky et al., 2012). That is, they capture different portions of the tax avoidance continuum which spans from highly certain (least tax aggressive) positions to highly uncertain (more

11) For example, significant *BTDs* could result from depreciation associated with large capital expenditures, which would not reflect tax planning strategies.

12) Desai and Dharmapala (2006) estimate total book-tax differences, following Manzon and Plesko (2002).

13) As including firm-fixed effects, the *DD* measure controls for nondiscretionary items that are constant over time for a firm (Frank et al., 2009).

tax aggressive) positions.¹⁴⁾ Specifically, effective tax rates capture overall tax avoidance and book-tax differences capture more aggressive tax strategies (Cazier et al. 2009; Lisowsky et al., 2012). In addition, these measures are not intended to capture qualitative nature of tax positions (Lisowsky et al., 2012).

Under these circumstances, FIN 48 implementation enables financial statement users and researchers to utilize new measures of tax avoidance, UTB data. UTBs by definition reflect the potential benefit of uncertain tax positions less than 50 percent likely to be sustained upon examination and/or the benefit less than 50 percent likely to be realized upon settlement. Accordingly, UTBs could capture tax positions that are along the tax avoidance continuum (Lisowsky et al., 2012). However, unlike most existing tax avoidance measures, this measure captures both conforming and non-conforming tax avoidance, excludes perfectly legal tax positions that would reflect real activities as well as tax avoidance activities undertaken to reduce tax costs (Lisowsky et al., 2012) and provides information on the magnitude of uncertain income tax avoidance (Koester, 2011). In addition, UTBs have a strong conceptual link to the highly uncertain (more tax aggressive) end of the tax avoidance continuum as involving both the quantification and the qualification of highly uncertain tax positions (Lisowsky et al., 2012). As a result, UTBs provide a promising measure of tax aggressiveness (e.g., Frischmann et al., 2008; Watson, 2011).¹⁵⁾ Indeed, prior studies find that UTBs are positively associated with tax sheltering, an extreme case of tax aggressive-

ness, while other measures of tax avoidance are not (Lisowsky et al., 2012) and that UTBs are associated with firm-specific factors that prior literature has shown to be related to tax shelter activities (Song and Tucker, 2008; Cazier et al., 2009).¹⁶⁾

However, UTBs could also reflect earnings management activities due to being subject to management judgment (e.g., De Waegenare, Sansing, and Wielhouwer, 2010; Hanlon and Heitzman, 2010). Specifically, FIN 48 requires firms to use judgment in determining which of the tax positions in tax filings are certain or uncertain and evaluating uncertain tax positions. In fact, prior studies find that a major percentage of firms reported the change in UTBs related to prior years' tax positions (Nichols, 2008) and that the change in UTBs related to current year's tax positions is also a noisy measure of income tax avoidance activities (De Simone et al., 2011). However, consistency in measurement and increased disclosures that are required under FIN 48 would lead to reduce managerial opportunism and increase transparency for UTBs. Indeed, prior literature finds that firms released substantial tax reserves prior to and at the adoption of FIN 48 (Blouin et al., 2010) and that FIN 48 curtails earnings management via tax reserves (Cazier et al., 2011; Gupta et al., 2011).

Taken together, the UTB measure overcomes many of shortcomings for alternate measures of income tax avoidance even though still being subject to managerial incentives to manage earnings (Watson, 2011).

In addition to UTBs, the portion of UTBs which would, if recognized, affect the *ETR* is also a newly available proxy for tax avoidance. It captures uncertain tax positions leading to permanent book-tax differences while not reflecting acquired UTBs and uncertain tax positions creating temporary or no book-tax differences (Cazier et al., 2009; Robinson and Schmidt, 2012).

14) I define tax aggressiveness as engaging in tax positions with greater uncertainty or relatively weaker facts (e.g., Frischmann et al., 2008; Lisowsky et al., 2012).

15) As the distribution of UTBs is highly skewed, prior research utilizes UTBs scaled by beginning total assets (e.g., Frischmann et al., 2008; Cazier et al., 2009). Indeed, Dunbar et al. (2007) document that analyzing raw UTBs might lead to misleading empirical results.

16) Tax sheltering contains tax positions with the greatest amount of uncertainty or the weakest facts (Lisowsky et al., 2012).

If a firm participates in uncertain tax avoidance activities and records UTBs which would, if recognized, impact the firm's income tax expense, the *ETR*, *BTD*, and *PBTD* based on the tax expense will not reflect the tax avoidance behavior. However, if a firm partially reserves for uncertain tax benefits, these measures would capture the tax avoidance activities. In contrast, regardless of whether UTBs are recorded, these avoidance activities reduce the *CETR* and the *LR_CETR* (Frischmann et al., 2008; Cazier et al., 2009). In fact, Cazier et al. (2009) find a negative association between the *LR_CETR* and UTBs while Frischmann et al. (2008) do not document a significant association between either the *LR_CETR* or *BTD* and UTBs.

However, UTBs also include uncertain tax positions creating temporary book-tax differences. Temporary differences can give rise to significant tax savings through deferred payments, whereas the cost of having the position overturned if audited by relevant taxing authorities would be less than having permanent differences overturned (Frischmann et al., 2008). Accordingly, prior research also examines the association between the portion of UTBs which would, if recognized, affect the *ETR* and existing tax avoidance measures, and finds that it is negatively (positively) associated with the *LR_CETR* (*BTD*) (Frischmann et al., 2008; Cazier et al., 2009).

III. Sample Construction and Results

3.1 Sample Construction

FIN 48 is effective for all public and non-public companies adhering to U.S. generally accepted accounting principles (GAAP), thus affecting Korean companies listed on NYSE and NASDAQ which prepare financial statements in accordance with both Korean and U.S. GAAP. As a result, the Korean firms were required to adopt the provisions of FIN 48 for fiscal years beginning after December 15, 2006.

We hand collect FIN 48 disclosures for the 13 Korean firms having calendar year-ends from their annual reports filed with the Securities and Exchange Commission (SEC), Forms 20-Fs, during 2007–2011, the post-FIN 48 periods.¹⁷⁾ We also hand collect other financial statement data for the Korean firms from their Forms 20-Fs to translate Korean Won amounts disclosed in financial statements into U.S. dollars at the same exchange rate, the noon buying rate of the U.S. Federal Reserve Bank of New York in effect at the end of each period.¹⁸⁾ These lead to 44 firm-year observations consisting of 31 from 8 firms listed on NYSE and 14 from 5 firms listed on NASDAQ. For our analyses, we classify the observations by two-digit Standard Industrial Classification (SIC) code, resulting in the industry distribution consisting of 12 from the depository institutions, 8 from both the communications and the business services, 6 from the electronic and other electric equipment, 4 from both the primary metal industries and the electric, gas, and sanitary services, and 2 from miscellaneous retail. We also classify the observations by size quintile (based on ending total assets).

We select the matched sample of U.S. companies for this study utilizing the following criteria: (1) fiscal year, (2) calendar year-end, (3) stock exchange, (4) two-digit SIC code, and (5) ± 10 percent range of total assets, creating 286 firm-year observations from 163 firms. We hand collect FIN 48

17) UTB data is commercially available from Compustat. However, Lisowsky et al. (2012) find that missing values in Compustat for the ending balance of UTBs (TXTUBEND) cannot be dealt with zero values and that Compustat sometimes reflects incorrect dollar units, indicating that researchers should validate the UTB data obtained from Compustat directly from financial statements. Indeed, consistent with the findings, we find that Compustat does not always provide correct information about UTB.

18) All the Korean firms do not use the same noon buying rate, and thus Compustat reflects the U.S. dollar amounts converted at different exchange rates.

disclosures for the U.S. firms from their annual reports filed with the SEC, Forms 10-Ks, and retrieve other financial statement data from Compustat.

3.2 Korean Companies' Disclosures under FIN 48

We first examine FIN 48 disclosures of the Korean companies with calendar-year ends listed on NYSE and NASDAQ during 2007-2011. Panel A of Table 1 provides unscaled summary statistics on the FIN 48 data for the Korean firms. The mean (median) beginning balance of UTBs (*BEG_UTB*) is \$22.77 million (\$4.08 million) and the mean (median) ending balance of UTBs (*END_UTB*) is \$21.68 million (\$2.98 million).¹⁹⁾ This mean decrease in UTBs, \$1.09 million, results from decreases related to both settlements with taxing authorities (*SETTLE*) and a lapse of the applicable statute of limitations (*SOL*), and increases and decreases related to both prior years' tax positions (*PRIOR_UTB*) and current year's tax positions (*CURR_UTB*). The largest change item is *SETTLE*, with a mean value of \$3.06 million, followed by the *CURR_UTB*, with a mean value of \$2.70 million. The mean (median) total amount of UTBs which would, if recognized, affect the *ETR* (*ETR_UTB*) is \$11.93 million (\$0.96 million), accounting for 55 percent (32 percent) of the mean (median) *END_UTB*. However, consistent with the findings of prior studies, the distribution of the FIN 48 data is highly skewed. Accordingly, we also utilize the FIN 48 data scaled by lagged total assets in this study.

Panel B of Table 1 presents summary statistics on the FIN 48 data scaled by lagged

total assets for the Korean firms. The mean *BEG_UTB* is 0.11 percent of total assets and the mean *END_UTB* is 0.13 percent of total assets. This mean increase in UTBs, 0.02 percent of total assets, results mainly from the *CURR_UTB*. The mean *ETR_UTB* is 0.09 percent of total assets, accounting for approximately 69 percent of the mean *END_UTB*. These results are inconsistent with Panel A of Table 1, indicating that analyzing the unscaled FIN 48 data could lead to misleading results.²⁰⁾

We also examine FIN 48 disclosures of the matched U.S. companies following the 5 criteria. Panel C of Table 1 reports unscaled summary statistics on the FIN 48 data for the matched U.S. sample firms. The mean (median) *BEG_UTB* is \$34.40 million (\$0.23 million) and the mean (median) *END_UTB* is \$29.73 million (\$0.27 million). This mean decrease in UTBs, \$4.67 million, results from *SETTLE* and *SOL*, and increases and decreases related to both prior years' and current year's tax positions. Consistent with Panel A of Table 1, the largest change item is *SETTLE*, with a mean value of \$10.36 million. However, the second largest change item is not the *CURR_UTB*, but the *PRIOR_UTB*, with a mean value of \$2.92 million. The mean (median) *ETR_UTB* is \$18.38 million (\$0.02 million), accounting for approximately 62 percent (7 percent) of the mean (median) *END_UTB*. However, consistent with Panel A of Table 1, the distribution of the FIN 48 data for the matched U.S. sample firms is highly skewed.

Panel D of Table 1 provides summary statistics on the FIN 48 data scaled by lagged total assets for the matched U.S. sample firms. The mean *BEG_UTB* is 1.66 percent of total assets and the mean *END_UTB* is 1.68 percent of total assets. Consistent with Panel B of Table 1, this mean increase in UTBs, 0.02 percent of total assets, results mainly from the *CURR_UTB*. The mean *ETR_UTB* is 0.90 percent of total assets,

19) As some Korean firms do not specify whether the gross amounts of UTBs include or exclude accrued interest and penalties, consistent with the prior literature's findings discussed in Section II, we use the definition of the gross UTBs that Blouin et al. (2007) do, UTBs excluding interest and penalties assuming that the reported UTBs already exclude interest and penalties, in our analyses.

20) This finding is consistent with Dunbar et al. (2007).

accounting for approximately 54 percent of the mean *END_UTB*.

Finally, Panels A and B of Table 1 also report whether the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample differs significantly at $p \leq 0.05$. First, Panel A shows even though all the mean differences for the unscaled FIN 48 data are not statistically significant, the mean *CURR_UTB* and the mean *SOL* are smaller for the matched U.S. firms while the mean values of the other FIN 48 data are not, which cause the *PRIOR_UTB*, with a mean value of \$2.92 million, to be the second largest change item. Next, in Panel B, tests for differences between

means show that the matched U.S. firms have larger *BEG_UTB*, *END_UTB*, *CURR_UTB*, and *ETR_UTB* relative to the Korean firms, which cause the *CURR_UTB* to still be the largest change item.

Panel A of Table 2 shows correlations between the *END_UTB* and the other FIN 48 data for the Korean firms. Consistent with Panel B of Table 1, there is significant and positive correlation between the *END_UTB* and either the *CURR_UTB* or the *ETR_UTB*. However, there is no significant correlation between the *PRIOR_UTB* reflecting managements' change in judgment and all the other FIN 48 data including the *END_UTB*.

Table 1
Descriptive Statistics of FIN 48 Data

Panel A: Summary statistics for Korean sample (in millions)

Variable	N	Mean	Std. Dev.	1st Pctl	25th Pctl	Median	75th Pctl	99th Pctl
<i>END_UTB</i>	44	21.6782	54.3960	-1.3905	0.0000	2.9776	16.1391	264.6887
<i>BEG_UTB</i>	44	22.7675	49.2066	-1.4311	0.0000	4.0814	18.6036	246.9726
<i>PRIOR_UTB</i>	44	1.5888	35.8408	-59.8867	-2.2406	0.0000	0.0000	224.1456
<i>CURR_UTB</i>	44	2.6953	6.0468	-4.5486	0.0000	0.1808	2.3813	32.7782
<i>SETTLE</i>	44	3.0623	11.5993	0.0000	0.0000	0.0000	0.0000	68.3853
<i>SOL</i>	44	2.3112	11.1280	0.0000	0.0000	0.0000	0.0000	69.4083
<i>OTHER_UTB</i>	44	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>ETR_UTB</i>	44	11.9346	40.5725	-22.2335	0.0000	0.9627	10.1102	264.6887
<i>ACC_IP</i>	44	-10.4519	56.8500	-260.8057	0.0000	0.1609	2.7424	43.2139
<i>REC_IP</i>	44	4.4730	28.3094	-37.4331	0.0000	0.0000	0.3153	156.1932

Panel A shows summary statistics for FIN 48 data of Korean sample, which are given in millions. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample reported in Panel C of Table 1 is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel B: Summary statistics for Korean sample (scaled by lagged total assets)

Variable	N	Mean	Std. Dev.	1st Pctl	25th Pctl	Median	75th Pctl	99th Pctl
<i>END_UTB</i>	44	0.0013*	0.0044	-0.0001	0.0000	0.0001	0.0005	0.0260
<i>BEG_UTB</i>	44	0.0011*	0.0035	-0.0001	0.0000	0.0002	0.0006	0.0209
<i>PRIOR_UTB</i>	44	0.0000*	0.0002	-0.0003	0.0000	0.0000	0.0000	0.0010
<i>CURR_UTB</i>	44	0.0004*	0.0017	-0.0002	0.0000	0.0000	0.0001	0.0104
<i>SETTLE</i>	44	0.0001*	0.0004	0.0000	0.0000	0.0000	0.0000	0.0026
<i>SOL</i>	44	0.0001*	0.0008	0.0000	0.0000	0.0000	0.0000	0.0050
<i>OTHER_UTB</i>	44	0.0000*	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>ETR_UTB</i>	44	0.0009*	0.0034	-0.0011	0.0000	0.0000	0.0002	0.0171
<i>ACC_IP</i>	44	0.0001*	0.0007	-0.0013	0.0000	0.0000	0.0001	0.0034
<i>REC_IP</i>	44	0.0001*	0.0003	-0.0002	0.0000	0.0000	0.0000	0.0013

Panel B shows summary statistics for FIN 48 data of Korean sample, which are scaled by lagged total assets. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample reported in Panel D of Table 1 is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel C: Summary statistics for the matched U.S. sample (in millions)

Variable	N	Mean	Std. Dev.	1st Pctl	25th Pctl	Median	75th Pctl	99th Pctl
<i>END_UTB</i>	286	29.7304	99.7069	0.0000	0.0000	0.2695	2.4210	434.0000
<i>BEG_UTB</i>	281	34.4044	120.9718	0.0000	0.0000	0.2310	2.4710	664.0000
<i>PRIOR_UTB</i>	277	2.9239	43.9026	-47.3000	0.0000	0.0000	0.0000	86.0000
<i>CURR_UTB</i>	277	2.3768	9.1140	0.0000	0.0000	0.0000	0.1500	47.5210
<i>SETTLE</i>	277	10.3643	96.1178	0.0000	0.0000	0.0000	0.0000	220.0000
<i>SOL</i>	277	0.5595	3.3586	0.0000	0.0000	0.0000	0.0000	13.7870
<i>OTHER_UTB</i>	277	1.4143	19.6140	-2.0000	0.0000	0.0000	0.0000	36.0000
<i>ETR_UTB</i>	260	18.3797	58.1158	0.0000	0.0000	0.0205	0.8630	310.0000
<i>ACC_IP</i>	274	5.4660	22.0355	0.0000	0.0000	0.0000	0.0914	113.0000
<i>REC_IP</i>	247	2.5232	18.0013	-2.0000	0.0000	0.0000	0.0000	77.0000

Panel C shows summary statistics for FIN 48 data of the matched U.S. sample, which are given in millions. See Appendix for the definitions for these variables.

Panel D: Summary statistics for the matched U.S. sample (scaled by lagged total assets)

Variable	N	Mean	Std. Dev.	1st Pctl	25th Pctl	Median	75th Pctl	99th Pctl
<i>END_UTB</i>	272	0.0168	0.0598	0.0000	0.0000	0.0024	0.0135	0.1495
<i>BEG_UTB</i>	269	0.0166	0.0601	0.0000	0.0000	0.0022	0.0137	0.1934
<i>PRIOR_UTB</i>	265	0.0003	0.0035	-0.0062	0.0000	0.0000	0.0000	0.0208
<i>CURR_UTB</i>	265	0.0011	0.0030	0.0000	0.0000	0.0000	0.0007	0.0165
<i>SETTLE</i>	265	0.0010	0.0118	0.0000	0.0000	0.0000	0.0000	0.0083
<i>SOL</i>	265	0.0003	0.0016	0.0000	0.0000	0.0000	0.0000	0.0092
<i>OTHER_UTB</i>	265	0.0002	0.0025	-0.0007	0.0000	0.0000	0.0000	0.0022
<i>ETR_UTB</i>	246	0.0090	0.0292	0.0000	0.0000	0.0004	0.0056	0.1481
<i>ACC_IP</i>	260	0.0014	0.0072	0.0000	0.0000	0.0000	0.0005	0.0247
<i>REC_IP</i>	234	0.0002	0.0016	-0.0012	0.0000	0.0000	0.0000	0.0029

Panel D shows summary statistics for FIN 48 data of the matched U.S. sample, which are scaled by lagged total assets. See Appendix for the definitions for these variables.

Panel B of Table 2 presents correlations between the *END_UTB* and the other FIN 48 data for the matched U.S. sample firms. Consistent with Panel D of Table 1 and Panel A of Table 2, there is a significant and positive correlation between the *END_UTB* and either the *CURR_UTB* or the *ETR_UTB*. However, the *END_UTB* is more highly correlated with the *ETR_UTB* than the *CURR_UTB*. There are also generally significant and positive correlations between the *END_UTB* and the other FIN 48 data.

In untabulated analyses, we find that most sample firms classify interest and penalties as income taxes and that some firms underestimate or overestimate the expected changes in UTBs during the next 12 months due to events such as the expiration of statute of limitations, the potential outcomes of ongoing examinations, and the negotiated settlement of certain disputed issues.²¹⁾ We also find that most sample firms consider exami-

nations for tax returns filed after 2000 to be open. The range of open tax years begins from 1992 to 2011 and Korean sample firms have an average of 4.22 tax years that remain open to examination by the NTS.²²⁾ In addition, it is unlikely that the NTS less frequently audits firms with strong facts. In fact, some firms with UTBs had not been examined by the NTS for more than 5 years, whereas most firms with no UTBs were examined when having 5 tax years that remain open

21) Approximately 30 percent (44 percent) of the Korean firm-years (the matched U.S. firm-years) do not provide the forward-looking disclosure.

22) Some matched U.S. firms define open tax years as years with net operating loss carryforwards, consistent with the findings of Blouin et al. (2007), as the Internal Revenue Service (IRS) is permitted to examine prior periods where net operating losses were generated and carried forward, and propose adjustments up to the amount of the net operating losses generated in those years.

Table 2
Correlation Matrix of FIN 48 Data

Panel A: Pearson correlations for Korean sample

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) <i>END_UTB</i>	1.0000								
(2) <i>BEG_UTB</i>	0.9886	1.0000							
(3) <i>PRIOR_UTB</i>	-0.1874	-0.2294	1.0000						
(4) <i>CURR_UTB</i>	0.9859	0.9742	-0.2345	1.0000					
(5) <i>SETTLE</i>	-0.0524	0.0691	0.0018	-0.0468	1.0000				
(6) <i>SOL</i>	0.8946	0.9102	-0.2562	0.9284	-0.0413	1.0000			
(7) <i>ETR_UTB</i>	0.9756	0.9510	-0.1423	0.9451	-0.0597	0.7870	1.0000		
(8) <i>ACC_IP</i>	0.8994	0.8849	-0.1366	0.8996	-0.0291	0.8113	0.8760	1.0000	
(9) <i>REC_IP</i>	0.5181	0.5044	0.2336	0.5113	0.1872	0.3840	0.5481	0.4932	1.0000

Panel A presents the Pearson correlation coefficients for FIN 48 data of Korean sample which are scaled by lagged total assets. We bold the coefficients which indicate significance at $p \leq 0.05$. See Appendix for variable definitions.

Panel B: Pearson correlations for the matched U.S. sample

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) <i>END_UTB</i>	1.0000								
(2) <i>BEG_UTB</i>	0.9981	1.0000							
(3) <i>PRIOR_UTB</i>	0.0917	0.0457	1.0000						
(4) <i>CURR_UTB</i>	0.3881	0.3579	0.1360	1.0000					
(5) <i>SETTLE</i>	0.0816	0.0957	0.0586	0.1618	1.0000				
(6) <i>SOL</i>	0.0909	0.1037	0.0637	0.3050	0.0340	1.0000			
(7) <i>ETR_UTB</i>	0.8290	0.8230	0.1594	0.3729	0.0533	0.1431	1.0000		
(8) <i>ACC_IP</i>	0.6257	0.6175	-0.0066	0.5192	0.0959	0.0766	0.3791	1.0000	
(9) <i>REC_IP</i>	0.8520	0.8518	0.0285	0.2656	0.1231	-0.0954	0.5162	0.7498	1.0000

Panel B presents the Pearson correlation coefficients for FIN 48 data of the matched U.S. sample which are scaled by lagged total assets. Due to missing data, we are not able to compute variables other than *END_UTB* for the matched U.S. sample of 272 firm-year observations. Accordingly, Panel B provides Pearson correlations between *END_UTB* and other variables for 212 firm-year observations where we are able to compute all variables other than *END_UTB*. We bold the coefficients which indicate significance at $p \leq 0.05$. See Appendix for variable definitions.

to examination.²³⁾

Taken together, consistent with the findings of prior research, FIN 48 improves consistency of disclosure and provides more information on the uncertainty in income taxes, but there is still inconsistency in the disclosures and more guidelines for disclosing the UTBs are needed. Specifically, some firms do not state whether the gross amounts of UTBs include or exclude accrued interest and penalties and the impact of changes in UTBs on balance sheet accounts except retained earnings such as deferred tax assets and liabilities, and goodwill even though they have the *ETR_UTB* smaller than the *END_UTB*. Moreover, forward-looking estimates

are subject to significant forecast errors and the explanations provided lack specificity. In addition to these shortcomings of the disclosures, the fact that some firms do not fully provide disclosure items required under FIN 48 could also lead to a decrease in the value of the FIN 48 disclosures.

As discussed previously, the explanations provided lack details. Specifically, the FIN 48 disclosures do not provide information on the nature of tax uncertainty. Under this circumstance, we analyze the uncertain tax positions for a certain Korean sample firm using confidential data. The firm has the uncertain tax position related to the tax exemption on small or medium venture start-up enterprises, which accounts for most of its recorded UTBs. The risk factor associated with the position is with regard to the income

23) In general, Korean firms are examined by the NTS every five years.

that can qualify as being exempt under the special tax treatment control law. According to article 6 of the special tax treatment control law, only the income derived from the business can qualify as tax-exempt income. The firm extended incidental business activities after applying the exemption provisions and viewed most of its revenue as the income derived from the business based on an established rule. However, it is more likely than not that the NTS does not view some of the revenue including advertising revenue as the income derived from the firm's business and thus excludes it from the tax-exempt income. The firm also has the uncertain tax position related to the unidentified difference between its database and accounting book. The firm reported the difference as cost of goods sold in its financial statements and treated the difference, unsettled, as reserves held by the firm on its tax return. However, it is more likely than not that the difference is viewed as being permanent and disposed of as the bonus of the CEO by the NTS, causing the firm to include the income tax on the difference in gross income on its tax return.

We also analyze the results of tax audits for Korean sample firms using the FIN 48 disclosures. Half of the Korean firms examined by the NTS disclose the results together with the FIN 48 disclosure items. Most of them indicate that they filed an appeal with respect to the NTS's tax assessments or that there were no significant adjustments to the prior years' tax returns while one of them indicates that it recognized additional material tax expenses as a result of the NTS's examination. Several matched U.S. firms also disclose their tax audit results. All of them indicate that there were no material adjustments to the prior years' tax returns or that refund claims with the IRS were filed. Moreover, we examine cumulative effect adjustments to the beginning balance of retained earnings for the year of adoption for the sample firms with tax reserves in the pre-FIN 48 periods. The mean effect of FIN 48 adoption on retained earnings was \$7.13 million

for the firms listed on NYSE, whereas the mean effect of adoption was -\$0.07 million for the firms listed on NASDAQ (untabulated). The average ratio of the adjustments to lagged total assets is -0.02 (-0.07) percent for the firms listed on NYSE (NASDAQ) (untabulated). These results show that larger firms released more tax reserves at the adoption of FIN 48, indicating that FIN 48 reduces, to some degree, earnings management via tax reserves, consistent with the findings of prior research.

3.3 Korean Companies' Tendencies of Tax Avoidance

In addition to the preceding analyses, we also examine the Korean companies' tax avoidance tendencies using measures of income tax avoidance discussed in Section II. First, we analyze the Korean firms' tax aggressiveness by stock exchange, size quintile and industry using both unscaled and scaled ending balance of UTBs. Panel A of Table 3 presents descriptive statistics for ending gross UTBs by stock exchange. The mean of unscaled ending UTBs for the Korean firms listed on NYSE, \$30.57 million, is larger than that for the firms listed on NASDAQ, \$0.48 million. In contrast, the mean *END_UTB* for the Korean firms listed on NYSE, 0.02 percent of total assets, is smaller than that for the firms listed on NASDAQ, 0.37 percent of total assets, indicating that examining the unscaled UTBs could lead to misleading results, as shown in Table 1. However, in untabulated analyses, we find that the mean *END_UTB* for the Korean firms listed on NYSE is not significantly different from that for the firms listed on NASDAQ. Whereas these untabulated tests report that the matched U.S. firms listed on NYSE have smaller *END_UTB* relative to the firms listed on NASDAQ, suggesting lesser tax aggressiveness.

Panel B of Table 3 reports the UTBs by size quintile. The mean *END_UTB* for the Korean firms in Asset Quintile 1, 0.49 percent of total assets, is larger than that for the firms in the other Asset Quintiles. How-

Table 3
Descriptive Statistics for Ending Unrecognized Tax Benefits (UTBs)

Panel A: Ending UTBs by stock exchange

Stock exchange	Korean sample						Matched U.S. sample					
	<i>END_UTB</i> (in millions)			<i>END_UTB</i>			<i>END_UTB</i> (in millions)			<i>END_UTB</i>		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
NYSE	31	30.5678*	62.9638	31	0.0002*	0.0004	33	247.0000	182.5000	33	0.0089	0.0089
NASDAQ	13	0.4797*	0.8622	13	0.0037*	0.0078	253	1.3948	5.3435	239	0.0179	0.0637
Total	44	21.6782*	54.3960	44	0.0013*	0.0044	286	29.7304	99.7069	272	0.0168	0.0598

Panel A shows summary statistics for ending UTBs by stock exchange. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for variable definitions.

Panel B: Ending UTBs by asset quintile

Asset Quintile	Korean sample						Matched U.S. sample					
	<i>END_UTB</i> (in millions)			<i>END_UTB</i>			<i>END_UTB</i> (in millions)			<i>END_UTB</i>		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Quintile 1	9	0.5505*	1.0195	9	0.0049*	0.0093	191	1.6797	6.1040	180	0.0219	0.0727
Quintile 2	9	1.3361*	2.5130	9	0.0005*	0.0009	74	30.4736	78.2972	71	0.0067	0.0110
Quintile 3	8	7.6558*	12.3152	8	0.0004*	0.0006	11	220.1000	184.8000	11	0.0113	0.0129
Quintile 4	9	21.5033*	39.0530	9	0.0001*	0.0002	3	549.7000	370.1000	3	0.0058	0.0038
Quintile 5	9	75.7871*	98.8986	9	0.0004*	0.0005	7	265.3000	49.5133	7	0.0011	0.0003
Total	44	21.6782*	54.3960	44	0.0013*	0.0044	286	29.7304	99.7069	272	0.0168	0.0598

Panel B shows summary statistics for ending UTBs by asset quintile. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for variable definitions.

Panel C: Ending UTBs by industry

Industry	Korean sample						Matched U.S. sample					
	<i>END_UTB</i> (in millions)			<i>END_UTB</i>			<i>END_UTB</i> (in millions)			<i>END_UTB</i>		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Primary metal industries	4	0.0000*	0.0000	4	0.0000*	0.0000	4	37.7500	11.3248	4	0.0010	0.0003
Electronic and other electric equipment	6	0.7777*	1.2153	6	0.0068*	0.0111	94	18.7424	52.9126	87	0.0246	0.0957
Communications	8	8.9986*	11.6402	8	0.0004*	0.0005	9	323.0000	141.0000	9	0.0167	0.0114
Electric, gas, and sanitary services	4	5.6336*	3.6168	4	0.0001*	0.0000	1	342.0000	.	1	0.0060	.
Miscellaneous retail	2	0.6410*	0.2219	2	0.0020*	0.0003	3	1.5477	1.3411	3	0.0043	0.0037
Depository institutions	12	71.0899*	88.1588	12	0.0003*	0.0004	9	351.6000	239.4000	9	0.0021	0.0028
Business services	8	0.0360*	0.0504	8	0.0004*	0.0005	166	1.0388	2.0739	159	0.0141	0.0330
Total	44	21.6782*	54.3960	44	0.0013*	0.0044	286	29.7304	99.7069	272	0.0168	0.0598

Panel C shows summary statistics for ending UTBs by industry. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for variable definitions.

ever, in untabulated analyses, we find that the mean END_UTB for the Korean firms in any Asset Quintile is not significantly different from that for the firms in the other Asset Quintiles. Whereas these tests show that the matched U.S. firms in Asset Quintile 1 (Asset Quintile 5) have larger END_UTB (smaller END_UTB) relative to the firms in any other Asset Quintiles except for Asset Quintile 3 (Asset Quintile 4). These results suggest that the smallest matched U.S. firms are relatively more tax aggressive than larger firms, consistent with Panel A of Table 3, and that firm size plays a role in the U.S. firms' tax aggressiveness. These may arise because smaller firms have a less risk of tax strategies than larger firms.

Panel C of Table 3 reports the UTBs by industry. The mean END_UTB for the Korean firms in the electronic and other electric equipment industry, 0.68 percent of total assets, is larger than that for the firms in any other industries. However, untabulated analyses show that the mean END_UTB for the Korean firms in the electronic and other electric equipment industry is not significantly different from that for the firms in the other industries. Instead, these tests report that the Korean firm in the miscellaneous retail industry has larger END_UTB relative to the firms in the communications, depository institutions and business services, suggesting greater tax aggressiveness. Where as the untabulated tests show that the matched U.S. firms in the business services industry have larger END_UTB relative to the firms in the primary metal industries, miscellaneous retail and depository institutions.²⁴⁾

24) Industry type is one of crucial factors in a firm's tax planning strategies since income characteristics, which affect the easiness of tax avoidance, depend on the type of industry. In fact, in both U.S. and Korea, there exist controlled foreign corporation (CFC) rules which prevent multinational firms from avoiding income taxes through their foreign subsidiaries in certain industries generating passive income that can be easily moved across countries (e.g., wholesale, real estate).

Second, we compare tax aggressiveness for the Korean and the matched U.S. firms using the means of the UTBs. Tests for differences between means in Table 3 report that the Korean firms have smaller END_UTB relative to the matched U.S. firms, as discussed in Table 1, suggesting the Korean firms are less tax aggressive than the matched U.S. firms. In addition, these tests show that the Korean firms listed on NYSE and NASDAQ, the Korean firms in the primary metal industries, communications and business services industry, and the Korean firms in any Asset Quintile except for Asset Quintile 4 have smaller END_UTB relative to the matched U.S. firms, suggesting lesser tax aggressiveness. However, given that tax uncertainty arises from the complexity of the application of income tax laws and regulations and the ambiguity of these laws and regulations, the difference of tax regime including income tax laws and regulations and their application may lead to these results. In addition, although FIN 48 would increase transparency for UTBs, the UTBs are still subject to earnings management (e.g., De Simone et al., 2011). Therefore, we must interpret the results with care.

Third, we analyze the Korean firms' tendencies of tax avoidance by stock exchange, size quintile and industry using the ETR_UTB and existing measures of income tax avoidance discussed in Section II. Firstly, with regard to the stock exchange, untabulated tests for differences between means show that the Korean firms listed on NYSE have higher LR_CETR relative to the firms listed on NASDAQ, suggesting a lower tendency of tax avoidance. In addition, these tests show that the matched U.S. firms listed on NYSE have smaller ETR_UTB compared to the firms listed on NASDAQ, suggesting a lower tendency of avoidance. Secondly, with regard to size quintile, these untabulated tests report that the Korean firms in Asset Quintile 1 have lower LR_CETR relative to the firms in Asset Quintiles 3 and 5. In addition, these tests suggest that the matched U.S. firms in Asset Quintile 1 have larger ETR_UTB compared to the firms in

any other Asset Quintiles and that the U.S. firms in Asset Quintile 5 have smaller *ETR_UTB* relative to the firms in any other Quintiles except for Asset Quintile 3. Thirdly, with regard to industry, these untabulated tests show that the Korean firm in the miscellaneous retail industry has larger *ETR_UTB*, *BTD* and *MPBTD*, and lower *LR_CETR* relative to the firms in the communications and depository institutions, suggesting a higher tendency of tax avoidance. Moreover, these tests show that the Korean firms in the electronic and other electric equipment industry have lower *ETR*, *CETR* and *LR_CETR*

compared to the firms in the communications. These tests also suggest that the matched U.S. firms in the business services industry have larger *ETR_UTB* and lower *ETR* relative to the firms in the primary metal industries, miscellaneous retail and depository institutions and that the U.S. firms in the electronic and other electric equipment industry have lower *ETR* and *LR_CETR* compared to the firms in the miscellaneous retail and depository institutions. In sum, the results concerning the firms' tax avoidance tendencies by stock exchange, size quintile and industry are mixed.

Table 4
Descriptive Statistics for Tax Avoidance Measures

Panel A: Summary statistics

Variable	Full sample			Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	316	0.0146	0.0558	44	0.0013*	0.0044	272	0.0168	0.0598
<i>ETR_UTB</i>	290	0.0077	0.0271	44	0.0009*	0.0034	246	0.0090	0.0292
<i>ETR</i>	330	-0.0574	1.3830	44	0.1500*	0.3749	286	-0.0893	1.4762
<i>CETR</i>	294	0.1298	0.7454	44	0.2451*	0.2411	250	0.1096	0.8006
<i>LR_CETR</i>	246	0.0557	0.6611	43	0.1848*	0.6056	203	0.0284	0.6704
<i>BTD</i>	168	-0.1405	0.6542	32	-0.0679*	0.1977	136	-0.1575	0.7203
<i>MPBTD</i>	250	-0.0689	0.2183	43	-0.0173*	0.0649	207	-0.0796	0.2368
<i>PBTD</i>	274	-0.0451	0.2894	44	-0.0226*	0.1173	230	-0.0494	0.3117
<i>DD</i>	250	-0.0600	0.2147	43	-0.0164*	0.0649	207	-0.0700	0.2328

Panel A presents summary statistics for tax avoidance measures. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel B: Pair-wise correlations

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) <i>END_UTB</i>		0.9053	-0.0389	-0.1520	-0.2098	-0.0561	-0.1681	-0.1216	-0.1528
(2) <i>ETR_UTB</i>	0.9048		-0.0327	-0.1162	-0.1333	-0.0379	-0.1338	-0.0619	-0.1179
(3) <i>ETR</i>	-0.0061	-0.0090		0.4236	0.4470	0.3187	0.3916	0.0522	0.3847
(4) <i>CETR</i>	-0.0389	-0.0001	-0.4159		0.5928	0.3919	0.3553	0.4273	0.3613
(5) <i>LR_CETR</i>	0.0055	0.0287	0.1021	0.0815		0.3093	0.2634	0.3974	0.2462
(6) <i>BTD</i>	-0.0449	-0.0185	-0.0024	0.0631	0.0791		0.7010	0.6459	0.7044
(7) <i>MPBTD</i>	-0.0530	0.0179	0.0222	0.1897	0.1703	0.4348		0.5547	0.9901
(8) <i>PBTD</i>	-0.0946	-0.0461	-0.1271	0.1824	0.1649	0.5193	0.7603		0.5590
(9) <i>DD</i>	-0.0420	0.0379	0.0228	0.2016	0.1585	0.4372	0.9955	0.7378	

Panel B presents the Pearson and Spearman correlation coefficients for tax avoidance measures of the full sample. Due to missing data, we are not able to compute variables other than *ETR* for the full sample of 330 firm-year observations. Accordingly, Panel B provides Pearson correlations among *UTB* and other avoidance measures for 131 firm-year observations where we are able to compute all the measures other than *ETR*. The lower (upper) diagonal reports Pearson (Spearman) correlations. We bold the coefficients which indicate significance at $p \leq 0.05$. See Appendix for variable definitions.

Finally, we compare tax avoidance tendencies of the Korean and the matched U.S. firms using the means of the *ETR_UTB* and existing measures of avoidance. Panel A of Table 4 provides a comparison of the Korean and the matched U.S. firms' tendencies of tax avoidance. Tests for differences between means show that the Korean firms have smaller *ETR_UTB* and higher *ETR* and *CETR* relative to the matched U.S. firms, suggesting a lower tendency of tax avoidance. However, other measures' mean differences are not statistically significant. In sum, the results of comparing the tax avoidance tendencies of the Korean and the matched U.S. firms are mixed. These may arise from the tax avoidance measures reflecting the different elements of corporate tax avoidance.

Panel B of Table 4 presents correlations between either the *END_UTB* or *ETR_UTB* and existing measures of tax avoidance for all sample firms. Consistent with Cazier et al. (2009), there is a significant and negative Spearman correlation between the *END_UTB* and the *LR_CETR*. In addition, consistent with Table 2, there are significant and positive Pearson and Spearman correlations between the *END_UTB* and the *ETR_UTB*. However, there are no significant correlations between the *ETR_UTB* and the existing avoidance measures.

Table 5 provides a comparison of the Korean and the matched U.S. firms' tendencies of avoidance by stock exchange. Tests for differences between means show that the Korean firms listed on NYSE and NASDAQ

Table 5
Stock Exchange and Tax Avoidance

Panel A: NYSE

Variable	N	Korean sample		Matched U.S. sample		
		Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	31	0.0002*	0.0004	33	0.0089	0.0089
<i>ETR_UTB</i>	31	0.0001*	0.0004	32	0.0049	0.0048
<i>ETR</i>	31	0.2133	0.2749	33	0.1330	0.7033
<i>CETR</i>	31	0.2682	0.2183	33	0.1933	0.3317
<i>LR_CETR</i>	30	0.3366	0.5146	31	0.0921	1.0734
<i>BTD</i>	19	0.0083	0.0372	26	0.0018	0.0796
<i>MPBTD</i>	31	-0.0003	0.0265	32	-0.0115	0.0619
<i>PBTD</i>	31	0.0068	0.0217	32	0.0176	0.0809

Panel A reports the tax avoidance tendencies of both Korean and the matched U.S. sample listed on NYSE. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel B: NASDAQ

Variable	N	Korean sample		Matched U.S. sample		
		Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	13	0.0037*	0.0078	239	0.0179	0.0637
<i>ETR_UTB</i>	13	0.0028*	0.0059	214	0.0096	0.0312
<i>ETR</i>	13	-0.0010	0.5287	253	-0.1183	1.5474
<i>CETR</i>	13	0.1899	0.2905	217	0.0968	0.8493
<i>LR_CETR</i>	13	-0.1655	0.6733	172	0.0169	0.5727
<i>BTD</i>	13	-0.1793	0.2761	110	-0.1952	0.7960
<i>MPBTD</i>	12	-0.0611	0.1062	175	-0.0921	0.2544
<i>PBTD</i>	13	-0.0929	0.2014	198	-0.0603	0.3333

Panel B reports the tax avoidance tendencies of both Korean and the matched U.S. sample listed on NASDAQ. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Table 6
Firm Size and Tax Avoidance

Panel A: Asset Quintile 1 (Smallest firms)

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	9	0.0049*	0.0093	180	0.0219	0.0727
<i>ETR_UTB</i>	9	0.0035*	0.0071	162	0.0116	0.0354
<i>ETR</i>	9	0.1623	0.2690	191	-0.0594	1.1992
<i>CETR</i>	9	0.1639	0.2795	161	0.0398	0.7458
<i>LR_CETR</i>	9	-0.3100	0.7663	126	0.0734	0.3185
<i>BTD</i>	9	-0.2412	0.3005	86	-0.2546	0.8597
<i>MPBTD</i>	9	-0.0887	0.1010	134	-0.0934	0.2143
<i>PBTD</i>	9	-0.1630	0.1562	149	-0.0788	0.2944

Panel A shows the tax avoidance tendencies of both Korean and the matched U.S. sample in Asset Quintile 1. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel B: Asset Quintile 2

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	9	0.0005*	0.0009	71	0.0067	0.0110
<i>ETR_UTB</i>	9	0.0005*	0.0009	64	0.0042	0.0081
<i>ETR</i>	9	-0.1005	0.5671	74	-0.2298	2.1317
<i>CETR</i>	9	0.2622	0.2757	68	0.2460	0.9850
<i>LR_CETR</i>	9	0.1711*	0.1512	58	-0.0793	0.8655
<i>BTD</i>	8	-0.0011	0.1265	36	0.0183	0.3735
<i>MPBTD</i>	8	0.0204	0.0569	53	-0.0708	0.3168
<i>PBTD</i>	9	0.0510	0.1385	61	0.0038	0.3849

Panel B shows the tax avoidance tendencies of both Korean and the matched U.S. sample in Asset Quintile 2. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel C: Asset Quintile 3

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	8	0.0004*	0.0006	11	0.0113	0.0129
<i>ETR_UTB</i>	8	0.0002*	0.0007	10	0.0048	0.0059
<i>ETR</i>	8	0.2351	0.0567	11	-0.0072	1.1274
<i>CETR</i>	8	0.2653	0.0960	11	0.1776	0.2938
<i>LR_CETR</i>	8	0.2894	0.0535	9	-0.4755	1.8106
<i>BTD</i>	3	0.0061	0.0039	6	-0.0396	0.1492
<i>MPBTD</i>	8	-0.0098	0.0198	10	-0.0218	0.1070
<i>PBTD</i>	8	0.0044	0.0085	10	0.0091	0.1370

Panel C shows the tax avoidance tendencies of both Korean and the matched U.S. sample in Asset Quintile 3. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel D: Asset Quintile 4

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	9	0.0001	0.0002	3	0.0058	0.0038
<i>ETR_UTB</i>	9	0.0000*	0.0001	3	0.0017	0.0003
<i>ETR</i>	9	0.3544	0.1985	3	0.2066	0.2631
<i>CETR</i>	9	0.3650	0.2870	3	0.3076	0.2418
<i>LR_CETR</i>	9	0.5063	0.9461	3	0.2186	0.1993
<i>BTD</i>	4	-0.0008	0.0106	1	0.0264	.
<i>MPBTD</i>	9	-0.0029	0.0311	3	0.0026	0.0191
<i>PBTD</i>	9	-0.0021	0.0173	3	0.0004	0.0092

Panel D shows the tax avoidance tendencies of both Korean and the matched U.S. sample in Asset Quintile 4. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel E: Asset Quintile 5 (Largest firms)

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	9	0.0004*	0.0005	7	0.0011	0.0003
<i>ETR_UTB</i>	9	0.0002*	0.0004	7	0.0009	0.0003
<i>ETR</i>	9	0.1082	0.4384	7	0.3241	0.1367
<i>CETR</i>	9	0.1712	0.1931	7	0.1970	0.6274
<i>LR_CETR</i>	8	0.2907	0.0668	7	0.6771	0.6882
<i>BTD</i>	8	-0.0012	0.0057	7	0.0034	0.0130
<i>MPBTD</i>	9	-0.0005*	0.0050	7	-0.0013	0.0128
<i>PBTD</i>	9	-0.0005*	0.0033	7	0.0062	0.0022

Panel E shows the tax avoidance tendencies of both Korean and the matched U.S. sample in Asset Quintile 5. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

have smaller *ETR_UTB* relative to the matched U.S. firms, consistent with the *END_UTB*. These results suggest that the Korean firms are less tax aggressive than the matched U.S. firms. However, given the difference of tax regime including income tax laws and regulations and their application, and the UTBs being still subject to earnings management (e.g., De Simone et al., 2011), the results are also interpreted with care.

Table 6 provides a comparison of the Korean and the matched U.S. firms' tax avoidance tendencies by size quintile. Tests for differences between means report that the Korean firms in any Asset Quintile have smaller *ETR_UTB* relative to the matched U.S. firms, consistent with the *END_UTB*. These also suggest the lesser tax aggressiveness of the Korean firms.

Table 7 provides a comparison of the

Korean and the matched U.S. firms' tax avoidance tendencies by industry. Tests for differences between means show that the Korean firm in the primary metal industries has smaller *ETR_UTB* relative to the matched U.S. firm, whereas these tests also show that the Korean firm in the primary metal industries has lower *ETR* compared to the matched U.S. firm. Moreover, the tests report that the Korean firms in the communications industry have smaller *ETR_UTB* and higher *CETR* and *LR_CETR* relative to the matched U.S. firms, indicating a lower tendency of tax avoidance. These tests also report that the Korean firm in the miscellaneous retail industry has lower *ETR* and larger *BTD*, *MPBTD* and *PBTD* compared to the matched U.S. firms, indicating a higher tendency of tax avoidance. Finally, the tests show that the

Table 7
Industry and Tax Avoidance

Panel A: Primary metal industries

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	4	0.0000*	0.0000	4	0.0010	0.0003
<i>ETR_UTB</i>	4	0.0000*	0.0000	3	0.0005	0.0001
<i>ETR</i>	4	0.2243*	0.0535	4	0.3578	0.0682
<i>CETR</i>	4	0.2683	0.1771	4	0.2484	0.4913
<i>LR_CETR</i>	4	0.2623	0.0243	2	-2.3294	4.1438
<i>BTD</i>	1	0.0119	-	0	-	-
<i>MPBTD</i>	4	0.0050	0.0350	4	-0.0094	0.0144
<i>PBTD</i>	4	0.0138	0.0145	4	-0.0040	0.0056

Panel A reports the tax avoidance tendencies of both Korean and the matched U.S. sample in the primary metal industries. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel B: Electronic and other electric equipment

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	6	0.0068	0.0111	87	0.0246	0.0957
<i>ETR_UTB</i>	6	0.0053	0.0083	78	0.0093	0.0321
<i>ETR</i>	6	0.0405	0.0925	94	0.0039	0.6249
<i>CETR</i>	6	0.0785	0.1353	75	0.1054	0.1917
<i>LR_CETR</i>	6	0.0427	0.0731	57	0.0949	0.2214
<i>BTD</i>	6	-0.2546	0.3770	49	-0.1708	0.3926
<i>MPBTD</i>	6	-0.0605	0.1260	70	-0.0993	0.2310
<i>PBTD</i>	6	-0.1311	0.2304	75	-0.1080	0.3112

Panel B reports the tax avoidance tendencies of both Korean and the matched U.S. sample in the electronic and other electric equipment industry. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel C: Communications

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	8	0.0004*	0.0005	9	0.0167	0.0114
<i>ETR_UTB</i>	8	0.0002*	0.0007	9	0.0070	0.0061
<i>ETR</i>	8	0.2147	0.0620	9	-0.0009	1.3033
<i>CETR</i>	8	0.3338*	0.1407	9	0.1232	0.1195
<i>LR_CETR</i>	8	0.3026*	0.0463	9	0.0547	0.1654
<i>BTD</i>	4	0.0007	0.0112	8	-0.0152	0.1346
<i>MPBTD</i>	8	-0.0085	0.0165	8	-0.0127	0.1249
<i>PBTD</i>	8	0.0072	0.0115	8	0.0070	0.1565

Panel C reports the tax avoidance tendencies of both Korean and the matched U.S. sample in the communications industry. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel D: Electric, gas, and sanitary services

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	4	0.0001	0.0000	1	0.0060	.
<i>ETR_UTB</i>	4	0.0000	0.0000	1	0.0020	.
<i>ETR</i>	4	0.3796	0.1771	1	0.4027	.
<i>CETR</i>	4	0.1902	0.2650	1	0.0290	.
<i>LR_CETR</i>	4	0.7786	1.4859	1	-0.0056	.
<i>BTD</i>	1	-0.0138	.	1	0.0264	.
<i>MPBTD</i>	4	-0.0192	0.0364	1	0.0216	.
<i>PBTD</i>	4	-0.0162	0.0021	1	-0.0102	.

Panel D reports the tax avoidance tendencies of both Korean and the matched U.S. sample in the electric, gas, and sanitary services industry. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel E: Miscellaneous retail

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	2	0.0020	0.0003	3	0.0043	0.0037
<i>ETR_UTB</i>	2	0.0020	0.0003	3	0.0033	0.0029
<i>ETR</i>	2	0.1092*	0.0587	3	0.3919	0.0283
<i>CETR</i>	2	0.1253	0.0668	3	0.4462	0.1590
<i>LR_CETR</i>	2	0.1070	0.0087	3	0.3669	0.1135
<i>BTD</i>	2	0.0716*	0.0037	3	0.0064	0.0063
<i>MPBTD</i>	2	0.0716*	0.0037	3	0.0002	0.0109
<i>PBTD</i>	2	0.0869*	0.0296	3	0.0039	0.0076

Panel E reports the tax avoidance tendencies of both Korean and the matched U.S. sample in the miscellaneous retail industry. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel F: Depository institutions

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	12	0.0003	0.0004	9	0.0021	0.0028
<i>ETR_UTB</i>	12	0.0002*	0.0003	9	0.0010	0.0004
<i>ETR</i>	12	0.1902	0.4174	9	0.2762	0.1820
<i>CETR</i>	12	0.2831	0.2703	9	0.2525	0.5545
<i>LR_CETR</i>	11	0.2918	0.0578	9	0.6001	0.6157
<i>BTD</i>	10	-0.0011	0.0051	7	0.0034	0.0130
<i>MPBTD</i>	12	-0.0010	0.0045	9	-0.0026	0.0123
<i>PBTD</i>	12	-0.0007*	0.0029	9	0.0061	0.0019

Panel F reports the tax avoidance tendencies of both Korean and the matched U.S. sample in the depository institutions industry. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Panel G: Business services

Variable	Korean sample			Matched U.S. sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
<i>END_UTB</i>	8	0.0004*	0.0005	159	0.0141	0.0330
<i>ETR_UTB</i>	8	0.0000*	0.0000	143	0.0097	0.0301
<i>ETR</i>	8	-0.0346	0.6883	166	-0.1891	1.8511
<i>CETR</i>	8	0.2700	0.3507	149	0.0922	1.0163
<i>LR_CETR</i>	8	-0.2897	0.8534	122	-0.0162	0.6599
<i>BTD</i>	8	-0.0974	0.1568	68	-0.1912	0.9618
<i>MPBTD</i>	7	-0.0552	0.0866	112	-0.0838	0.2616
<i>PBTD</i>	8	-0.0530	0.1705	130	-0.0259	0.3353

Panel G reports the tax avoidance tendencies of both Korean and the matched U.S. sample in the business services industry. * indicates the difference between the mean of the variable for Korean sample and the mean of the variable for the matched U.S. sample is significant at $p \leq 0.05$. See Appendix for the definitions for these variables.

Korean firms in both the depository institutions and business services industries have smaller *ETR_UTB* relative to the matched U.S. firms.

IV. Conclusions

Prior to FIN 48, there was no specific guidance on how to address accounting for the uncertainty in income taxes, leading to divergent accounting practices. Accordingly, the FASB issued FIN 48 to increase comparability of reporting for income taxes and provide more information on income tax uncertainty. In this paper, we undertake a detailed analysis of FIN 48 disclosures for calendar-year-end Korean firms listed on NYSE and NASDAQ. The analysis shows that scaled ending UTBs increased after the adoption and were mainly accounted for by uncertain tax positions leading to permanent book-tax differences. In addition, the analysis reveals that it is unlikely that the NTS less frequently audits firms with strong facts. However, we also document that more guidance on how to disclose the UTBs are needed and that the FIN 48 disclosures do not provide information on the nature of tax uncertainty. Accordingly, we also analyze the uncertain tax positions for a certain Korean sample firm using confidential data.

FIN 48 also enables financial statement users and researchers to use new measures

of tax avoidance, UTB data. In fact, prior research suggests that UTBs provide a promising measure of tax aggressiveness. Thus, we analyze the Korean firms' tax aggressiveness utilizing scaled ending UTBs. The results indicate that firm size do not play a role in the Korean firms' tax aggressiveness and stock exchange, contrary to the matched U.S. firms and that the Korean firm in the miscellaneous retail industry is more tax aggressive than the firms in the communications, depository institutions and business services. Moreover, we document that the Korean firms are less tax aggressive than the matched U.S. firms and that the Korean firms listed on NYSE and NASDAQ, the Korean firms in the primary metal industries, communications and business services industry, and the Korean firms in any Asset Quintile except for Asset Quintile 4 are less tax aggressive than the matched U.S. firms. However, the difference of tax regime including income tax laws and regulations and their application may lead to these results. Furthermore, even though FIN 48 would increase transparency for UTBs, the UTBs are still subject to earnings management (e.g., De Simone et al., 2011). Hence, the results must be interpreted with care.

We also analyze the Korean firms' tax avoidance tendencies using other measures of tax avoidance. The analysis shows that the results concerning the firms' tendencies

of tax avoidance by stock exchange, size quintile and industry are mixed. We also find mixed results when comparing tendencies of tax avoidance of the Korean and the matched U.S. firms. These may arise from the tax avoidance measures reflecting the different elements of avoidance. Further, we examine the association between the scaled ending UTBs and other measures of tax avoidance and find a significant and negative association between the UTBs and the long-run cash effective tax rate.

As a final caveat, our findings are based on a small sample of Korean firms listed on NYSE and NASDAQ that limits the extent to which we can generalize the results. Given the globalization of capital markets and the growth of Korean firms, future research could analyze tendencies of tax avoidance of the Korean firms listed on NYSE and NASDAQ utilizing the dataset that supplements our limitation and various matching methods. Future research also could examine more detailed uncertain tax positions for the firms and the determinants of the firms' UTBs and tax avoidance tendencies.

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[Appendix] Variable Definitions

Variable	Definition
<i>END_UTB</i>	Ending balance of unrecognized tax benefits (UTBs) by lagged total assets (AT);
<i>BEG_UTB</i>	Beginning balance of UTBs scaled by lagged total assets (AT);
<i>PRIOR_UTB</i>	Change in UTBs as a result of prior years' tax positions scaled by lagged total assets (AT);
<i>CURR_UTB</i>	Change in UTBs as a result of current year's tax positions scaled by lagged total assets (AT);
<i>SETTLE</i>	Reductions to UTBs due to settlements with taxing authorities scaled by lagged total assets (AT);
<i>SOL</i>	Reductions to UTBs due to a lapse of the applicable statute of limitations scaled by lagged total assets (AT);
<i>OTHER_UTB</i>	The ratio of other changes in UTBs to lagged total assets (AT);
<i>ETR_UTB</i>	Portion which would, if recognized, affect the effective tax rate, scaled by lagged total assets (AT);
<i>ACC_IP</i>	Tax related interest and penalties recognized in the statement of operations scaled by lagged total assets (AT);
<i>REC_IP</i>	Tax related interest and penalties recognized in the statement of financial position scaled by lagged total assets (AT);
<i>ETR</i>	The ratio of total income taxes (TXT) to pretax income (PI);
<i>CETR</i>	The ratio of cash taxes paid (TXPD) to pretax income (PI);
<i>LR_CETR</i>	The ratio of the three year sum of cash taxes paid (TXPD) to the three year sum of pretax income (PI);
<i>BTD</i>	The ratio of (pretax income (PI) minus minority interest (MII) and estimated taxable income) to lagged total assets (AT), where estimated taxable income = {(current federal tax expense (TXFED)+current foreign tax expense (TXFO)) / statutory rate} - a change in tax loss carry forward (Δ TLCF). If TXFED and TXFO are missing, (TXFED+TXFO) is calculated by (TXT - TXDI - TXS - TXO);
<i>MPBTD</i>	The ratio of (U.S. domestic financial income (PIDOM) minus U.S. domestic taxable income, state income taxes (TXS), other income taxes (TXO) and equity in earnings (ESUB)) to lagged total assets (AT), where U.S. domestic taxable income = current federal tax expense (TXFED) / statutory rate. If PIDOM is missing, then we use PI multiplied by the ratio of domestic sales;
<i>PBTD</i>	The ratio of (pretax income (PI) minus minority interest (MII) and estimated taxable income) to lagged total assets (AT), where estimated taxable income = {(current federal tax expense (TXFED) + current foreign tax expense (TXFO)) / statutory rate} - (deferred tax expense (TXDI) / statutory rate); and
<i>DD</i>	<p>$\mu_i + \epsilon_{i,t}$ from the following regression:</p> $BT_{i,t} = \beta_1 TA_{i,t} + \mu_i + \epsilon_{i,t}$ <p>where BT is the Manzon-Plesko book-tax difference (<i>MPBTD</i>) scaled by lagged total assets (AT), TA is total accruals calculated as in Hribar and Collins (2002), scaled by lagged total assets (AT), μ_i is the average value of the residual for firm i over the sample period and $\epsilon_{i,t}$ is the deviation in year t from firm i's average residual.</p>

Compustat acronyms are reported in parentheses. For Korean firms, *BTD*, *MPBTD*, and *PBTD* are calculated using current domestic tax expense instead of current federal tax expense and *MPBTD* is also calculated using Korean domestic financial income instead of U.S. domestic financial income.

FIN 48 주식사항 검토: 한국기업을 중심으로

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FIN 48은 기업들이 불확실한 조세 포지션을 평가하고 이와 관련된 부채인 미인식 세제혜택(UTB)에 대한 정보를 공시하여야 한다고 명시하고 있다. 본 연구는 12월 결산 뉴욕증권거래소 및 나스닥 상장 한국기업의 FIN 48 주식사항을 분석하였으며, 또한 FIN 48 하에 계상된 미인식 세제혜택(UTB)을 이용하여 동 기업의 과세공격적 행위에 대하여 검토하였다. 검토 결과 첫째, 대응되는 미국기업과 달리, 증권거래소와 기업규모가 동 한국기업의 과세공격적 행위에 중요한 역할을 하지 못하는 것으로 나타났다. 둘째, 소매 산업에 속한 한국기업이 통신, 금융 및 비즈니스 서비스 산업에 속한 한국기업보다 더욱 과세공격적인 성향을 보였다. 셋째, 동 한국기업은 대응되는 미국기업에 비하여 덜 과세공격적인 성향을 나타냈다. 본 연구는 또한 다른 조세회피 측정치들을 이용하여 동 한국기업의 조세회피성향을 검토하였으며 이는 혼재된 결과를 보여주었다. 마지막으로 본 연구는 미인식 세제혜택(UTB)과 다른 조세회피 측정치들 간 상관관계를 분석하였으며 그 결과 미인식 세제혜택(UTB)과 장기현금유효세율 간에 통계적으로 유의미한 음의 상관관계가 있는 것으로 나타났다.

주제어: FIN 48, ASC 740-10, 미인식 세제혜택, 조세회피행위, 과세공격적 행위

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